

SEQUENCE LISTING

<110> Kuramitsu Seiki,
Yokoyama Shigeyuki

<120> GENE ENCODING DNA REPAIR ENZYME

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<151> 2001-02-23

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<170> PatentIn Ver. 2.0

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Ser	Glu	Val	Leu	Leu	Gln	Gln	Thr	Arg	Val	Glu	Gln	Ala	Leu	Pro	Tyr	
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Tyr	Arg	Arg	Phe	Leu	Glu	Arg	Phe	Pro	Thr	Leu	Lys	Ala	Leu	Ala	Ala	
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Ala	Ser	Leu	Glu	Glu	Val	Leu	Arg	Val	Trp	Gln	Gly	Ala	Gly	Tyr	Tyr	
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Arg	Arg	Ala	Glu	His	Leu	His	Arg	Leu	Ala	Arg	Ser	Val	Glu	Glu	Leu	

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Pro	Pro	Ser	Phe	Ala	Glu	Leu	Arg	Gly	Leu	Pro	Gly	Leu	Gly	Pro	Tyr										
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Gly Glu Gly Glu Asp Pro Trp Lys Arg Pro Leu Pro Lys Leu Met Glu
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aag gtc ctc cgc aag gcg ctt ccc ctc ctc gct cat gcg ggc gta gtc 960
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Tyr Arg Arg Phe Leu Glu Arg Phe Pro Thr Leu Lys Ala Leu Ala Ala
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Ala Ser Leu Glu Glu Val Leu Arg Val Trp Gln Gly Ala Gly Tyr Tyr
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Arg Arg Ala Glu His Leu His Arg Leu Ala Arg Ser Val Glu Glu Leu
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Pro Pro Ser Phe Ala Glu Leu Arg Gly Leu Pro Gly Leu Gly Pro Tyr
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Thr Ala Ala Ala Val Ala Ser Ile Ala Phe Gly Glu Arg Val Ala Ala
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Val Asp Gly Asn Val Arg Arg Val Leu Ser Arg Leu Phe Ala Arg Glu
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Ser Pro Lys Glu Lys Glu Leu Phe Ala Leu Ala Gln Gly Leu Leu Pro
145 150 155 160

Glu Gly Val Asp Pro Gly Val Trp Asn Gln Ala Leu Met Glu Leu Gly
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Ala Thr Val Cys Leu Pro Lys Arg Pro Arg Cys Gly Ala Cys Pro Leu
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Gly Ala Phe Cys Arg Gly Lys Glu Ala Pro Gly Arg Tyr Pro Ala Pro
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Arg Lys Arg Arg Ala Lys Glu Glu Arg Leu Val Ala Leu Val Leu Leu
210 215 220

Gly Arg Lys Gly Val His Leu Glu Arg Leu Glu Gly Arg Phe Gln Gly
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Leu Tyr Gly Val Pro Leu Phe Pro Pro Glu Glu Leu Pro Gly Arg Glu
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Ala Ala Phe Gly Val Arg Ser Arg Pro Leu Gly Glu Val Arg His Ala
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Leu Thr His Arg Arg Leu Arg Val Glu Val Arg Gly Ala Leu Trp Glu
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Gly Glu Gly Glu Asp Pro Trp Lys Arg Pro Leu Pro Lys Leu Met Glu
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Gln Trp Arg Glu Val Met Ala Ala Leu Glu Val Gly Pro Glu Ala Ala
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ctg gcc tac tgg cac cgg ggc ttt agg cgc aag gag gac ctg gac ccc 144
Leu Ala Tyr Trp His Arg Gly Phe Arg Arg Lys Glu Asp Leu Asp Pro

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Leu Glu Glu Ala Leu Arg Gln Gly Lys Arg Ile Arg Val His Gly Asp	
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Tyr Asp Ala Asp Gly Leu Thr Gly Thr Ala Ile Leu Val Arg Gly Leu	
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Glu Gly Tyr Gly Val Leu Met Glu Arg Val Pro Glu His Leu Glu Ala	
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His Thr Pro Gly Lys Thr Pro Ser Pro Gly Leu Val Val His Pro Ala	
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Leu Thr Pro Asp Leu Lys Glu Lys Pro Thr Gly Ala Gly Val Val Phe	
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Glu Tyr Ala Asp Leu Ala Ala Val Gly Thr Ile Ala Asp Val Ala Pro	
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Pro Ala Ser Ser Trp Val Gly Leu Arg Leu Leu Ala Glu Ala Val Gly	
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Tyr Thr Gly Lys Ala Val Glu Val Ala Phe Arg Ile Ala Pro Arg Ile	
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Leu Thr Asp Asp Ala Ala Glu Ala Gln Ala Leu Val Gly Glu Leu His	
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Glu Ala Thr Leu Arg Pro Val Phe Leu Val Ala Gln Gly Lys Gly Thr	
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Tyr Ala Ala Arg Phe Pro Asp Pro Val Arg Glu Val Ala Leu Leu Asp	
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Phe Gly Ala Pro Glu Glu Ala Arg Arg Leu Gly Glu Gly Arg His Leu	
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Lys Pro Glu Ala Leu Glu Gly Gly Ile Ala Pro Phe Ala Tyr Pro Leu	
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Pro Arg Pro Val Leu Gly Arg Arg Val Glu Val Ala Leu Gly Arg Glu	
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1998

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 Tyr Asp Ala Asp Gly Leu Thr Gly Thr Ala Ile Leu Val Arg Gly Leu
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 100 105 110
 Glu Gly Tyr Gly Val Leu Met Glu Arg Val Pro Glu His Leu Glu Ala
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 Ser Asp Leu Phe Leu Thr Val Asp Cys Gly Ile Thr Asn His Ala Glu
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 His Thr Pro Gly Lys Thr Pro Ser Pro Gly Leu Val Val His Pro Ala
 165 170 175
 Leu Thr Pro Asp Leu Lys Glu Lys Pro Thr Gly Ala Gly Val Val Phe
 180 185 190
 Leu Leu Leu Trp Ala Leu His Glu Arg Leu Gly Leu Pro Pro Pro Leu
 195 200 205

Glu Tyr Ala Asp Leu Ala Ala Val Gly Thr Ile Ala Asp Val Ala Pro
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 Leu Trp Gly Trp Asn Arg Ala Leu Val Lys Glu Gly Leu Ala Arg Ile
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 Pro Ala Ser Ser Trp Val Gly Leu Arg Leu Leu Ala Glu Ala Val Gly
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 Tyr Thr Gly Lys Ala Val Glu Val Ala Phe Arg Ile Ala Pro Arg Ile
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 Asn Ala Ala Ser Arg Leu Gly Glu Ala Glu Lys Ala Leu Arg Leu Leu
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 Leu Thr Asp Asp Ala Ala Glu Ala Gln Ala Leu Val Gly Glu Leu His
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 Leu Leu Pro Gln Ala Asp Pro Glu Ala Lys Ala Ile Val Leu Leu Asp
 325 330 335
 Pro Glu Gly His Pro Gly Val Met Gly Ile Val Ala Ser Arg Ile Leu
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 Glu Ala Thr Leu Arg Pro Val Phe Leu Val Ala Gln Gly Lys Gly Thr
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 Val Arg Ser Leu Ala Pro Ile Ser Ala Val Glu Ala Leu Arg Ser Ala
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 Glu Asp Leu Leu Leu Arg Tyr Gly Gly His Lys Glu Ala Ala Gly Phe
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 Ala Met Asp Glu Ala Leu Phe Pro Ala Phe Lys Ala Arg Val Glu Ala
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 Tyr Ala Ala Arg Phe Pro Asp Pro Val Arg Glu Val Ala Leu Leu Asp
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Ala Phe Arg Leu Lys Gly Val Arg Val Leu Ala Trp Lys Gln Gly Asp
485 490 495

Leu Ala Leu Pro Pro Glu Val Glu Val Ala Gly Leu Leu Ser Glu Asn
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Ala Trp Asn Gly His Leu Ala Tyr Glu Val Gln Ala Val Asp Leu Arg
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Pro Leu Leu Glu Ala Leu Ala Arg Ala Arg Leu Gly Glu Gly Val Tyr
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Val Pro Glu Asp Asn Pro Glu Gly Leu Asp Tyr Ala Arg Lys Ala Gly
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Phe Arg Leu Leu Pro Pro Glu Glu Ala Gly Leu Trp Leu Gly Leu Pro
580 585 590

Pro Arg Pro Val Leu Gly Arg Arg Val Glu Val Ala Leu Gly Arg Glu
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Ala Arg Ala Arg Leu Ser Ala Pro Pro Val Leu His Thr Pro Glu Ala
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Arg Leu Lys Ala Leu Val His Arg Arg Leu Leu Phe Ala Tyr Glu Arg
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Lys	Arg	Val	Ser	Leu	Arg	Thr	Leu	Trp	Glu	Leu	Pro	Gly	Ser	Val	Leu	100	105	110	
Val	Ser	Pro	Leu	Asp	Leu	Glu	Ala	Val	Leu	Gly	Pro	Lys	Glu	Glu	Arg	115	120	125	
Arg	Ala	Tyr	Leu	Asp	Arg	Leu	Ile	Ala	Arg	Phe	Ser	Arg	Arg	Tyr	Ala	130	135	140	
Ala	Leu	Leu	Ser	Ala	Tyr	Glu	Lys	Ala	Leu	Arg	Gln	Arg	Asn	Ala	Leu	145	150	155	160
Leu	Lys	Ala	Gly	Gly	Glu	Gly	Leu	Ser	Ala	Trp	Asp	Arg	Glu	Leu	Ala	165	170	175	
Arg	Tyr	Gly	Asp	Glu	Ile	Val	Ala	Leu	Arg	Arg	Arg	Phe	Leu	Arg	Arg	180	185	190	
Phe	Ala	Pro	Ile	Leu	Arg	Glu	Val	His	Ala	Ala	Leu	Ala	Ala	Lys	Glu	195	200	205	
Ala	Gly	Leu	Arg	Leu	Glu	Glu	Thr	Ala	Gly	Glu	Gly	Val	Leu	Arg	Ala	210	215	220	
Leu	Glu	Ala	Ser	Arg	Ala	Glu	Glu	Arg	Glu	Arg	Gly	Gln	Thr	Leu	Val	225	230	235	240
Gly	Pro	His	Arg	Asp	Asp	Leu	Val	Phe	Leu	Leu	Glu	Gly	Arg	Pro	Ala	245	250	255	
His	Arg	Phe	Ala	Ser	Arg	Gly	Glu	Ala	Lys	Thr	Leu	Ala	Leu	Ala	Leu	260	265	270	
Arg	Leu	Ala	Glu	His	Arg	Leu	Leu	Gly	Glu	His	His	Gly	Glu	Pro	Pro	275	280	285	
Leu	Leu	Leu	Val	Asp	Glu	Trp	Gly	Glu	Glu	Leu	Asp	Glu	Ala	Arg	Arg	290	295	300	
Arg	Ala	Val	Leu	Ala	Tyr	Ala	Gln	Ala	Leu	Pro	Gln	Ala	Ile	Leu	Ala	305	310	315	320
Gly	Leu	Glu	Ala	Pro	Pro	Gly	Val	Pro	Val	Cys	Ser	Val	Val	Arg	Gly	325	330	335	

Val Val Leu Cys Pro Gly Ala
340

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<211> 2934
<212> DNA
<213> *Thermus thermophilus*

<220>
<221> CDS
<222> (1).. (2934)

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atg gaa atc gcg cta gag agg atc tac ggc cac cgc ctg gcg ctc ccg 48
Met Glu Ile Ala Leu Glu Arg Ile Tyr Gly His Arg Leu Ala Leu Pro
1 5 10 15

cag gtg ggg gcg gcc ttg ctt ttc gcc cag gag gcc ccc ccg gcc ctc 96
Gln Val Gly Ala Ala Leu Leu Phe Ala Gln Glu Ala Pro Pro Ala Leu
20 25 30

ctc ctc gtc ccc gag gcg cgg ctt agg cgc tac cgg gac ctc tcc gcc 144
Leu Leu Val Pro Glu Ala Arg Leu Arg Arg Tyr Arg Asp Leu Ser Ala
35 40 45

ttc ggg gcc aag gtc tac gtg aac ccc ggc ctc gag gcc ctg gag gaa 192
Phe Gly Ala Lys Val Tyr Val Asn Pro Gly Leu Glu Ala Leu Glu Glu
50 55 60

aaa gcc ctc ttc gtc ctc tcc tac gag gag gcc cta agc ccc ttc ccc 240
Lys Ala Leu Phe Val Leu Ser Tyr Glu Glu Ala Leu Ser Pro Phe Pro
65 70 75 80

gag gac cct gag gcc tgg cgg ctt ctt ctg gag gtg ggc cgc gcc tac 288
Glu Asp Pro Glu Ala Trp Arg Leu Leu Leu Glu Val Gly Arg Ala Tyr
85 90 95

ccc cgg gag gcc ctc ctc tcc cgc ctc ctc aag ctg ggc tac gcc cgg 336
Pro Arg Glu Ala Leu Leu Ser Arg Leu Leu Lys Leu Gly Tyr Ala Arg
100 105 110

gac gag gac tac cgc gtc ctg ggg gag gtg gtg gag ctc ggc gag gtg 384
Asp Glu Asp Tyr Arg Val Leu Gly Glu Val Val Glu Leu Gly Glu Val
115 120 125

cgc ctg gag ttc ttc ggg gac gag ctg gaa agg ctt gtg gtc cgg ggg 432
Arg Leu Glu Phe Phe Gly Asp Glu Leu Glu Arg Leu Val Val Arg Gly
130 135 140

gag Glu 145	gaa Glu	agg Arg	cgg Arg	cgc Arg	cac His	gtc Val	ctt Leu	ctg Leu	ccc Pro	aag Lys	ccg Pro	ggg Gly	aag Lys	gcg Ala	gag Glu	480
ggc Gly	ttc Phe	acc Thr	tcc Ser	aag Lys	aag Lys	gtc Val	ctc Leu	cac His	ttc Phe	cct Pro	ggc Gly	ccc Pro	gtc Val	tac Tyr	ctg Leu	528
gac Asp	acc Thr	ccc Pro	gcc Ala	ctc Leu	gcc Ala	ccc Pro	aag Lys	gcc Ala	ctt Leu	tgg Trp	ccc Pro	ctc Leu	ctc Leu	gcg Ala	gga Gly	576
agg Arg	ccc Pro	tgg Trp	gtg Val	gcc Ala	ctg Leu	ggc Gly	ggc Gly	ggg Gly	gtg Val	gag Glu	ctc Leu	ccc Pro	ccc Pro	ttg Leu	gag Glu	624
ctc Leu	ggg Gly	gcg Ala	agg Arg	ccc Pro	ctt Leu	cct Pro	cct Pro	tac Tyr	cgg Arg	gga Gly	agc Ser	ctg Leu	aag Lys	gcc Ala	ctg Leu	672
gaa Glu 225	aag Lys	gac Asp	ctc Leu	gcc Ala	cgc Arg	tgg Trp	ctt Leu	gcc Ala	gag Glu	ggg Gly	aag Lys	cgg Arg	gtc Val	cac His	ctc Leu	720
ttc Phe	gtg Val	ggc Gly	cac His	gcc Ala	cgc Arg	acc Thr	ttg Leu	gag Glu	tac Tyr	ctc Leu	aaa Lys	agg Arg	cgc Arg	ctc Leu	cag Gln	768
gcc Ala	ttc Phe	tcg Ser	ccc Pro	ctc Leu	atc Ile	ctg Leu	gac Asp	cgc Arg	ttc Phe	ccc Pro	ggc Gly	ccc Pro	aag Lys	ggg Gly	cgg Arg	816
ctt Leu	gcc Ala	ctc Leu	ctc Leu	ccc Pro	ggg Gly	gac Asp	ttt Phe	gag Glu	ggc Gly	ggg Gly	gcg Ala	gag Glu	tgg Trp	gga Gly	gag Glu	864
tgg Trp	gtc Val	ctc Leu	ctc Leu	acc Thr	gag Glu	gcc Ala	ctg Leu	gtc Val	ttc Phe	gcc Ala	acc Thr	ggg Gly	ggg Gly	gtg Val	cgg Arg	912
gcc Ala 305	agg Arg	gtc Val	cgg Arg	gta Val	ggg Gly	gag Glu	ggg Gly	ctc Leu	agc Ser	gac Asp	ccc Pro	ggg Gly	gcc Ala	ctt Leu	tcc Ser	960
cca Pro	ggg Gly	gac Asp	tac Tyr	ctc Leu	atc Ile	cac His	ccg Pro	gag Glu	cac His	ggc Gly	gtc Val	ggg Gly	cag Gln	tac Tyr	ctg Leu	1008
ggc Gly	ctc Leu	gag Glu	acc Thr	cgg Arg	gag Glu	gtc Val	ctg Leu	ggg Gly	gtc Val	aag Lys	cgg Arg	gac Asp	tac Tyr	ctg Leu	gtc Val	1056

ctg cgc tac aag ggg gaa ggg aag ctc tac ctc ccc gtg gag cag ctt	1104
Leu Arg Tyr Lys Gly Glu Gly Lys Leu Tyr Leu Pro Val Glu Gln Leu	
355 360 365	
ccc ctc ctc aag cgc cac ccc ggg acc acc gac gac ccc ccg gag ctt	1152
Pro Leu Leu Lys Arg His Pro Gly Thr Thr Asp Asp Pro Pro Glu Leu	
370 375 380	
tcc tcc ctg ggc aag aac gag tgg caa agg gcc aag gag cgg gcg cgg	1200
Ser Ser Leu Gly Lys Asn Glu Trp Gln Arg Ala Lys Glu Arg Ala Arg	
385 390 395 400	
aag gac gtg gag gag ctg gct ggg cgc ctc ctc gtc ctc cag gcc aag	1248
Lys Asp Val Glu Glu Leu Ala Gly Arg Leu Leu Val Leu Gln Ala Lys	
405 410 415	
cgc aag gcc acc ccg ggc cgg gcc ttt ccc cct ttg ccc gag tgg gat	1296
Arg Lys Ala Thr Pro Gly Arg Ala Phe Pro Pro Leu Pro Glu Trp Asp	
420 425 430	
cct ctg gtg gag aag ggg ttc ccc tac gag ctc acc ccc gac cag aag	1344
Pro Leu Val Glu Lys Gly Phe Pro Tyr Glu Leu Thr Pro Asp Gln Lys	
435 440 445	
cgg gcc ctg gag gag gtc ctc cgc gac ctg gaa agc ccc cac ccc atg	1392
Arg Ala Leu Glu Glu Val Leu Arg Asp Leu Glu Ser Pro His Pro Met	
450 455 460	
gac cgc ctg gtc tcg ggg gac gtg ggc ttc ggc aag acg gag gtg gcc	1440
Asp Arg Leu Val Ser Gly Asp Val Gly Phe Gly Lys Thr Glu Val Ala	
465 470 475 480	
ctg agg gcc gcc cac cgg gtg gtg ggg cac ggg gcc cag gtg gcc ttc	1488
Leu Arg Ala Ala His Arg Val Val Gly His Gly Ala Gln Val Ala Phe	
485 490 495	
ctg ggg cca acc acc ctc ctc gcc gag cag cac ggg aag acc ttt agg	1536
Leu Gly Pro Thr Thr Leu Leu Ala Glu Gln His Gly Lys Thr Phe Arg	
500 505 510	
gag cgc ttc cag ggg ctt ccc gtg agg gtt gcg gtc ctc tcc cgc ttc	1584
Glu Arg Phe Gln Gly Leu Pro Val Arg Val Ala Val Leu Ser Arg Phe	
515 520 525	
acc ccg ccc aag gag gag gag gcc atc cta aaa ggc ctc gcc gag ggg	1632
Thr Pro Pro Lys Glu Glu Glu Ala Ile Leu Lys Gly Leu Ala Glu Gly	
530 535 540	
acg gtg gac atc gtc atc ggc acc cac cgc ctc ctc cag gag gac gtg	1680
Thr Val Asp Ile Val Ile Gly Thr His Arg Leu Leu Gln Glu Asp Val	

545	550	555	560	
cgc ttc agg gac ctc	ggc ctc ctc atc	gtg gac gag gag cac	cgc ttc	1728
Arg Phe Arg Asp Leu	Gly Leu Leu Ile	Val Asp Glu Glu His	Arg Phe	
565		570	575	
ggc gtg gcc caa aag	gag agg atc	cgg gag ctc aag	gcg gag gtg gac	1776
Gly Val Ala Gln Lys	Glu Arg Ile	Arg Glu Leu Lys	Ala Glu Val Asp	
580		585	590	
acc ctc tac ctc tcc	gcc acc ccc atc	ccc cgc acc ctc	tac tcc gcc	1824
Thr Leu Tyr Leu Ser	Ala Thr Pro Ile	Pro Arg Thr Leu	Tyr Ser Ala	
595		600	605	
ctg gtg ggc ctc aaa	gac ctt tcc agc	atc cag acc ccg	ccc ccg ggg	1872
Leu Val Gly Leu Lys	Asp Leu Ser Ser	Ile Gln Thr Pro	Pro Pro Gly	
610		615	620	
cgc aag ccc atc aag	acc ttc ctc gct	ccc ttt gat ccc	ctc ttg gtg	1920
Arg Lys Pro Ile Lys	Thr Phe Leu Ala	Pro Phe Asp Pro	Leu Leu Val	
625		630	635	640
cgg gag gcc atc ctc	ttt gag ctg gag	cgt ggg ggc aag	gtc ttc tac	1968
Arg Glu Ala Ile Leu	Phe Glu Leu Glu	Arg Gly Gly Lys	Val Phe Tyr	
645		650	655	
gtc cac gac cgg gtg	gcc tcc ata gag	gcc agg cgg cgc	ttt ctg gaa	2016
Val His Asp Arg Val	Ala Ser Ile Glu	Ala Arg Arg Arg	Phe Leu Glu	
660		665	670	
aac ctc gtc ccc gag	gcc cgc atc ggg	gtg gtc cac ggc	cag atg ccc	2064
Asn Leu Val Pro Glu	Ala Arg Ile Gly	Val Val His Gly	Gln Met Pro	
675		680	685	
gaa agc ctc att gag	gag acc atg ctc	ctc ttc gcc gaa	ggg gcg tac	2112
Glu Ser Leu Ile Glu	Glu Thr Met Leu	Leu Phe Ala Glu	Gly Ala Tyr	
690		695	700	
gac gtc ctc ctc gcc	acc acc atc att	gag gcg ggc ctg	gac gtg ccc	2160
Asp Val Leu Leu Ala	Thr Thr Ile Ile	Glu Ala Gly Leu	Asp Val Pro	
705		710	715	720
gag gcg aac acc atc	ctc att gag cgg	gcg gac cgc ctg	ggc ctc gcc	2208
Glu Ala Asn Thr Ile	Leu Ile Glu Arg	Ala Asp Arg Leu	Gly Leu Ala	
725		730	735	
acc ttg tac cag ctc	cgg ggc cgg gtg	ggg cgg agg gag	gag gag gcc	2256
Thr Leu Tyr Gln Leu	Arg Gly Arg Val	Gly Arg Arg Glu	Glu Glu Ala	
740		745	750	
tac gcc tac ctc ttc	cac ccg cct cgc	ctc acc gag gcc	gcg gag aag	2304

Tyr Ala Tyr Leu Phe His Pro Pro Arg Leu Thr Glu Ala Ala Glu Lys	
755	760 765
cgc ctc gcc gcc atc gcc gac ctc tcc gat ctg gcc tcg ggc cac ctc	2352
Arg Leu Ala Ala Ile Ala Asp Leu Ser Asp Leu Gly Ser Gly His Leu	
770	775 780
ctg gcc gaa agg gac atg gaa atc cgg ggc gtg ggg aac ctt ttg ggg	2400
Leu Ala Glu Arg Asp Met Glu Ile Arg Gly Val Gly Asn Leu Leu Gly	
785	790 795 800
ccg gag cag cac ggg cac atc cgg gcg ctt tcc ctc gag gtc tac acc	2448
Pro Glu Gln His Gly His Ile Arg Ala Leu Ser Leu Glu Val Tyr Thr	
805	810 815
gag ctt ctg gaa gag gcc atc cgc aag ctc aag ggg gag gcc aag gag	2496
Glu Leu Leu Glu Glu Ala Ile Arg Lys Leu Lys Gly Glu Ala Lys Glu	
820	825 830
gag cgg cgg cac gtg acc ctg gac ctc gcc ctc tcc gcc cgg ctg ccc	2544
Glu Arg Arg His Val Thr Leu Asp Leu Ala Leu Ser Ala Arg Leu Pro	
835	840 845
gcg gag tac gtg ggg agc ctc gag gcc agg agc cgc tac tac agc cgt	2592
Ala Glu Tyr Val Gly Ser Leu Glu Ala Arg Ser Arg Tyr Tyr Ser Arg	
850	855 860
ttt gcc gag gcg aaa agc ctc gcc gag ctt tcc cgc ctg gtg cgg gag	2640
Phe Ala Glu Ala Lys Ser Leu Ala Glu Leu Ser Arg Leu Val Arg Glu	
865	870 875 880
ctc aaa gag cgc tac ggg ccc ctt cct gag gag gcg gag aac ttc gtg	2688
Leu Lys Glu Arg Tyr Gly Pro Leu Pro Glu Glu Ala Glu Asn Phe Val	
885	890 895
gcc ctc gcc cgg ctc cgc ctg gtg gcg gag agg aag ggg gtg gtg tcc	2736
Ala Leu Ala Arg Leu Arg Leu Val Ala Glu Arg Lys Gly Val Val Ser	
900	905 910
atc acg gag ggc ctc acc cac ctg gag gtg gtc ttc ccc cgc tac ccc	2784
Ile Thr Glu Gly Leu Thr His Leu Glu Val Val Phe Pro Arg Tyr Pro	
915	920 925
ctg gac tac gac gcc cgc ggc ctc aag ggg ctt ccc tac cgg gtg gag	2832
Leu Asp Tyr Asp Ala Arg Gly Leu Lys Gly Leu Pro Tyr Arg Val Glu	
930	935 940
ctt acg cag tac cgc ccc ggg ttc cgc ctg gag aag aag ggc ctg agg	2880
Leu Thr Gln Tyr Pro Pro Gly Phe Arg Leu Glu Lys Lys Gly Leu Arg	
945	950 955 960

ccc cgg gac tac ccc gag gcc ctg atg gag gtg ctc tac ctc ttc gcc 2928
 Pro Arg Asp Tyr Pro Glu Ala Leu Met Glu Val Leu Tyr Leu Phe Ala
 965 970 975

gac ctc 2934
 Asp Leu

<210> 8
 <211> 978
 <212> PRT
 <213> Thermus thermophilus

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 1 5 10 15

Gln Val Gly Ala Ala Leu Leu Phe Ala Gln Glu Ala Pro Pro Ala Leu
 20 25 30

Leu Leu Val Pro Glu Ala Arg Leu Arg Arg Tyr Arg Asp Leu Ser Ala
 35 40 45

Phe Gly Ala Lys Val Tyr Val Asn Pro Gly Leu Glu Ala Leu Glu Glu
 50 55 60

Lys Ala Leu Phe Val Leu Ser Tyr Glu Glu Ala Leu Ser Pro Phe Pro
 65 70 75 80

Glu Asp Pro Glu Ala Trp Arg Leu Leu Leu Glu Val Gly Arg Ala Tyr
 85 90 95

Pro Arg Glu Ala Leu Leu Ser Arg Leu Leu Lys Leu Gly Tyr Ala Arg
 100 105 110

Asp Glu Asp Tyr Arg Val Leu Gly Glu Val Val Glu Leu Gly Glu Val
 115 120 125

Arg Leu Glu Phe Phe Gly Asp Glu Leu Glu Arg Leu Val Val Arg Gly
 130 135 140

Glu Glu Arg Arg Arg His Val Leu Leu Pro Lys Pro Gly Lys Ala Glu
 145 150 155 160

Gly Phe Thr Ser Lys Lys Val Leu His Phe Pro Gly Pro Val Tyr Leu
 165 170 175

Asp Thr Pro Ala Leu Ala Pro Lys Ala Leu Trp Pro Leu Leu Ala Gly
 180 185 190

Arg Pro Trp Val Ala Leu Gly Gly Gly Val Glu Leu Pro Pro Leu Glu

195	200	205
Leu Gly Ala Arg Pro Leu Pro Pro Tyr Arg Gly Ser Leu Lys Ala Leu		
210	215	220
Glu Lys Asp Leu Ala Arg Trp Leu Ala Glu Gly Lys Arg Val His Leu		
225	230	235 240
Phe Val Gly His Ala Arg Thr Leu Glu Tyr Leu Lys Arg Arg Leu Gln		
	245	250 255
Ala Phe Ser Pro Leu Ile Leu Asp Arg Phe Pro Gly Pro Lys Gly Arg		
	260	265 270
Leu Ala Leu Leu Pro Gly Asp Phe Glu Gly Gly Ala Glu Trp Gly Glu		
	275	280 285
Trp Val Leu Leu Thr Glu Ala Leu Val Phe Ala Thr Gly Gly Val Arg		
	290	295 300
Ala Arg Val Arg Val Gly Glu Gly Leu Ser Asp Pro Gly Ala Leu Ser		
305	310	315 320
Pro Gly Asp Tyr Leu Ile His Pro Glu His Gly Val Gly Gln Tyr Leu		
	325	330 335
Gly Leu Glu Thr Arg Glu Val Leu Gly Val Lys Arg Asp Tyr Leu Val		
	340	345 350
Leu Arg Tyr Lys Gly Glu Gly Lys Leu Tyr Leu Pro Val Glu Gln Leu		
	355	360 365
Pro Leu Leu Lys Arg His Pro Gly Thr Thr Asp Asp Pro Pro Glu Leu		
	370	375 380
Ser Ser Leu Gly Lys Asn Glu Trp Gln Arg Ala Lys Glu Arg Ala Arg		
385	390	395 400
Lys Asp Val Glu Glu Leu Ala Gly Arg Leu Leu Val Leu Gln Ala Lys		
	405	410 415
Arg Lys Ala Thr Pro Gly Arg Ala Phe Pro Pro Leu Pro Glu Trp Asp		
	420	425 430
Pro Leu Val Glu Lys Gly Phe Pro Tyr Glu Leu Thr Pro Asp Gln Lys		
	435	440 445
Arg Ala Leu Glu Glu Val Leu Arg Asp Leu Glu Ser Pro His Pro Met		
450	455	460
Asp Arg Leu Val Ser Gly Asp Val Gly Phe Gly Lys Thr Glu Val Ala		

465	470	475	480
Leu Arg Ala Ala His Arg Val Val Gly His Gly Ala Gln Val Ala Phe	485	490	495
Leu Gly Pro Thr Thr Leu Leu Ala Glu Gln His Gly Lys Thr Phe Arg	500	505	510
Glu Arg Phe Gln Gly Leu Pro Val Arg Val Ala Val Leu Ser Arg Phe	515	520	525
Thr Pro Pro Lys Glu Glu Glu Ala Ile Leu Lys Gly Leu Ala Glu Gly	530	535	540
Thr Val Asp Ile Val Ile Gly Thr His Arg Leu Leu Gln Glu Asp Val	545	550	555
Arg Phe Arg Asp Leu Gly Leu Leu Ile Val Asp Glu Glu His Arg Phe	565	570	575
Gly Val Ala Gln Lys Glu Arg Ile Arg Glu Leu Lys Ala Glu Val Asp	580	585	590
Thr Leu Tyr Leu Ser Ala Thr Pro Ile Pro Arg Thr Leu Tyr Ser Ala	595	600	605
Leu Val Gly Leu Lys Asp Leu Ser Ser Ile Gln Thr Pro Pro Pro Gly	610	615	620
Arg Lys Pro Ile Lys Thr Phe Leu Ala Pro Phe Asp Pro Leu Leu Val	625	630	635
Arg Glu Ala Ile Leu Phe Glu Leu Glu Arg Gly Gly Lys Val Phe Tyr	645	650	655
Val His Asp Arg Val Ala Ser Ile Glu Ala Arg Arg Arg Phe Leu Glu	660	665	670
Asn Leu Val Pro Glu Ala Arg Ile Gly Val Val His Gly Gln Met Pro	675	680	685
Glu Ser Leu Ile Glu Glu Thr Met Leu Leu Phe Ala Glu Gly Ala Tyr	690	695	700
Asp Val Leu Leu Ala Thr Thr Ile Ile Glu Ala Gly Leu Asp Val Pro	705	710	715
Glu Ala Asn Thr Ile Leu Ile Glu Arg Ala Asp Arg Leu Gly Leu Ala	725	730	735
Thr Leu Tyr Gln Leu Arg Gly Arg Val Gly Arg Arg Glu Glu Glu Ala			

740					745					750						
Tyr	Ala	Tyr	Leu	Phe	His	Pro	Pro	Arg	Leu	Thr	Glu	Ala	Ala	Glu	Lys	
755					760					765						
Arg	Leu	Ala	Ala	Ile	Ala	Asp	Leu	Ser	Asp	Leu	Gly	Ser	Gly	His	Leu	
770					775					780						
Leu	Ala	Glu	Arg	Asp	Met	Glu	Ile	Arg	Gly	Val	Gly	Asn	Leu	Leu	Gly	
785					790					795					800	
Pro	Glu	Gln	His	Gly	His	Ile	Arg	Ala	Leu	Ser	Leu	Glu	Val	Tyr	Thr	
805					810					815						
Glu	Leu	Leu	Glu	Glu	Ala	Ile	Arg	Lys	Leu	Lys	Gly	Glu	Ala	Lys	Glu	
820					825					830						
Glu	Arg	Arg	His	Val	Thr	Leu	Asp	Leu	Ala	Leu	Ser	Ala	Arg	Leu	Pro	
835					840					845						
Ala	Glu	Tyr	Val	Gly	Ser	Leu	Glu	Ala	Arg	Ser	Arg	Tyr	Tyr	Ser	Arg	
850					855					860						
Phe	Ala	Glu	Ala	Lys	Ser	Leu	Ala	Glu	Leu	Ser	Arg	Leu	Val	Arg	Glu	
865					870					875					880	
Leu	Lys	Glu	Arg	Tyr	Gly	Pro	Leu	Pro	Glu	Glu	Ala	Glu	Asn	Phe	Val	
885					890					895						
Ala	Leu	Ala	Arg	Leu	Arg	Leu	Val	Ala	Glu	Arg	Lys	Gly	Val	Val	Ser	
900					905					910						
Ile	Thr	Glu	Gly	Leu	Thr	His	Leu	Glu	Val	Val	Phe	Pro	Arg	Tyr	Pro	
915					920					925						
Leu	Asp	Tyr	Asp	Ala	Arg	Gly	Leu	Lys	Gly	Leu	Pro	Tyr	Arg	Val	Glu	
930					935					940						
Leu	Thr	Gln	Tyr	Pro	Pro	Gly	Phe	Arg	Leu	Glu	Lys	Lys	Gly	Leu	Arg	
945					950					955					960	
Pro	Arg	Asp	Tyr	Pro	Glu	Ala	Leu	Met	Glu	Val	Leu	Tyr	Leu	Phe	Ala	
965					970					975						

Asp Leu

$\langle 210 \rangle$	9
$\langle 211 \rangle$	38
$\langle 212 \rangle$	DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 9

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38

<210> 10

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 10

atatagatct ttattatgctg tccgggaggg ggactacgcc c

41

<210> 11

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 11

atcatatgag agaccgggtc cgctggcggg t

31

<210> 12

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 12

atagatcttt acaggtccac cgcctggacc tc

32

<210> 13

<211> 49

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

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49

<210> 14

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 14

atatcatatg cgtcttctcc tcttcggca acggaact

38

<210> 15

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 15

atatagatct ttattaggcg ccagggcaca ggaccacccc t

41

<210> 16

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

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<210> 17

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 17

atatagatct ttattagagg tcggcgaaga ggtagagcac c

41

09938901 082401
"04280" 0688660